



A Publication of the Southeast River Forecast Center, Peachtree City, Georgia

Improving Situational Awareness in the SERFC

by Mark Fuchs

“Situational Awareness” (SA) has become a big buzz phrase in recent years, with much of the buzz focusing on technological tools, including SA display monitors, GIS tools, and software enhancements. While SA has always been an unstated but understood goal at the SERFC, this office has recently focused on a variety of ways of improving SA, both high-tech and otherwise.

In the high-tech arena, HIC John Feldt, hydrologist Mark Love and others are looking into purchasing SA display monitors to be placed in the office’s operations area. Mark has also developed several GIS-based displays improving operational SA. One display shows the latest flood status of all basins in the SERFC area. Another display generates forecast hydrographs of points at or above flood stage. Displayed in the operations area, this program retrieves the

latest data every 10 minutes. A third display summarizes any SAC soil moisture accounting parameter on a basin-delineated map of the SERFC area. HAS forecaster Jeff Dobur has created GIS-based D2D map background files of fast-responding basins. These additional maps should help the HAS or evening forecaster see when excessive rainfall is impacting the fastest-responding basins forecast by the SERFC.

Another tool to improve office SA is called the Daily Situational Awareness Product, or DSAP. Also developed by Jeff Dobur, this product forces the HAS forecaster and the HOC to coordinate on a series of questions pertaining to office needs based on the evolving hydrometeorological situation. The product is compiled twice a day. The day’s first assessment is due at 8:30 a.m., focusing on flooding potential.

The final assessment at 1:30 p.m. adds questions about staffing needs during the evening and overnight periods, as well as staffing needs for the next few days.

In the low-tech category, senior hydrologist Jonathan Atwell is leading an effort to improve operational verbal communication among the HAS, the HOC, and the various hydrologic forecasters. This effort has already led to the removal of half-wall partitions in the operations area, which inhibited verbal communications among forecasters. After this change is evaluated, additional physical improvements will be considered.

These changes represent a beginning in what may be a multi-year effort in improving office SA at the SERFC.

Model Calibration and Development Update

by Brad Gimmestad

Contents

Improving Situational Awareness in the SERFC

Model Calibration and Development Update

HIC Meanderings

Weather Ranger Booth a Hit at WeatherFest

SERFC Hosts Chinese Scientists

HydroTools for the WFO Toolbox

John Feldt-HIC, SERFC

Mark Fuchs, Editor

www.srh.noaa.gov/serfc

The SERFC is completing concentrated river modeling work in South Carolina, as attention now shifts to Georgia rivers.

While the SERFC continually works to develop new forecast sites and make improvements to existing sites in the hydrologic model throughout the Southeast United States, recent work has focused on reviewing and “perfecting” entire river basins in the model. Much of this push is associated with the Advanced Hydrologic Prediction Service (AHPS) program. This funding has been provided every year since 2003. Up to 2005, most effort was spent on all the rivers in North Carolina and Virginia in the SERFC area. Since 2005, the focus has been on the

basins of South Carolina. This effort involved the recalibration of four river forecast sites and the review of ratings and model performance at all river segments in the hydrologic model. In addition, AHPS funding employed a contractor to complete six calibrations and a detailed study of seven reservoirs.

Future plans call for a continued expansion to the west. A recent “scrub” was completed by a group of SERFC hydrologists. This effort has identified additional calibration and model development needs in the Savannah, Altamaha, and Apalachicola basins of Georgia.

HIC Meanderings

by John Feldt

More and more people are moving to the Southeast U.S., especially to urban cities and along the coast. Consequently, the need for flood warning and forecast services has been significantly increasing. Many of these locations are river headwaters, often along the outskirts of urban areas, such as Atlanta or Birmingham.

These rivers react very quickly. While the more typical method of river forecasting is to measure how much rain has fallen and then make a river prediction, these fast-responding rivers necessitate a more proactive approach towards forecasting.

The SERFC is focusing significant attention on this forecast challenge in 2006.

Called the **Fast-Responding Basin Improvement Initiative (FARBII)**, this project will help develop procedures and methods that directly lead towards forecast improvement.

Significant progress has already been made.

- A Daily Situational Awareness Product (DSAP) has been developed (see “Improving Situation Awareness” article this issue).
- We have modified our operations area to foster more efficient Hydrometeorological Operations Coordinator (HOC)/Hydrometeorological Analysis and Support forecaster (HAS) coordination.

Our Area of Emphasis for 2006: FARBII

□ The “Site Specific” model has been developed at 47 locations to serve as an alternate model to enhance NWSRFS.

□ Our morning hydrometeorology briefings are now an integrated HOC/HAS effort.

We have developed a variety of GIS-based situational awareness products and displays.

These are just a few of the tasks that have been implemented to improve both the lead time and accuracy of our faster-responding forecast locations. Look for additional improvements throughout 2006.

Weather Ranger Booth a Hit at WeatherFest

by Christine McGehee & Todd Hamill

The American Meteorological Society’s “Weatherfest,” a science and weather fair to kick off the AMS 86th Annual Meeting in Atlanta, Ga., drew an estimated 2500 people the afternoon of January 29th. More than 50 organizations participated, each with a booth that introduced kids to aspects of the earth and atmospheric sciences in an entertaining way.

The SERFC booth was especially popular with the young crowd. For the event, an SERFC summer volunteer and a few handy hydrometeorologists built a scaled-down model of a flash flood, teaching attendees about the dangers of flood water. SERFC staff encouraged children to push a toy car

into the water to see that it would be washed downstream. Meanwhile, a continually-running flash flood video and the SERFC staff emphasized the dangers of flooding in real life.

The NOAA Weather Ranger made his public debut at WeatherFest. The comic book hero’s first episode, entitled “Turn Around, Don’t Drown,” was displayed on the big screen at the SERFC booth. The episode revolves around the valiant superhero saving a young man who thoughtlessly drives into an area where water was crossing the road. After the rescue, the Weather Ranger presents the young man with the Weather Ranger’s calling card, emphasizing flood safety rules. Those

attending also walked away with a coloring and activity book that asked questions and offered even more information concerning flood safety.



Weather Ranger creator Rick Ullom oversees the WeatherFest activities

SERFC Hosts Chinese Scientists



HAS Forecaster Jeff Dobur describes the HAS function at the SERFC

A delegation from the China Yangtze Three Gorges Project Development Corporation visited the NWS Southeast River Forecast Center on December 13, 2005.

The Three Gorges Dam is a major flood control facility which has significantly increased the economic viability of the region. The Three Gorges Dam features the largest hydropower plant in the world. The Three Gorges section of the Yangtze River was once full of dangerous shoals and rapids. Since the dam was built, this river has become a navigable waterway.

The delegation included the project director, chief economist, several engineers, and even a leading official of the Chinese Ministry.

The Georgia Institute of Technology sponsored the delegation’s visit. Reggina Cabrera (senior hydrologist) coordinated the visit at the SERFC. Cabrera, along with Jeff Dobur (HAS meteorologist), and John Feldt (hydrologist in charge), gave presentations about SERFC operations to the visiting scientists.

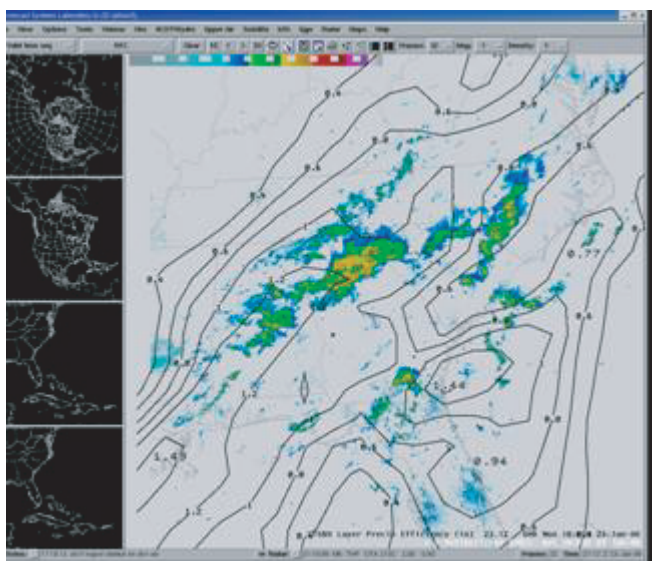


Hydro Tools for the WFO Toolbox

Hydro Tools for the WFO Toolbox: This new section in “The Channel” will highlight both old and new tools used by the Southeast River Forecast Center that could be utilized by the WFO community to enhance their day-to-day forecast operations. To let us know how you like this section, email Jeffrey.Dobur@noaa.gov or Mark.Fuchs@noaa.gov.

Improving Your Precipitation Forecast using Model-Derived Precipitation Efficiency

by Jeff Dobur



*PE can be added to your operational forecasting
by localizing it to your D2D volume browser.*

Precipitation forecasts are a critical element in producing accurate river stage forecasts with the greatest lead time. Perhaps the greatest challenge in forecasting accurate precipitation amounts is correctly predicting the spatial distribution of these amounts, as this determines what basins excessive runoff (and flooding) is expected to occur. For this reason, SERFC hydrometeorological analysis and support (HAS) meteorologists have often used a model-derived precipitation efficiency product locally added into D2D to aid in evaluating the future spatial and temporal distribution of precipitation. The model-derived precipitation efficiency (PE) can be derived from any numerical weather prediction model where precipitable water (PW) for the entire atmospheric column and mean relative humidity (RH) for the 1000-700 hPa layer can be computed. PE is computed as follows:

$$PE = PW * (1000-700 MRH)$$

where PE = precipitation efficiency, PW = precipitable water through the entire depth of the atmosphere (inches) , and 1000-700 MRH is the mean relative humidity over the 1000-700 hPa layer, expressed as a decimal value.

Though PE is not a stand-alone indicator for precipitation, it has been used successfully in evaluating the spatial and temporal distribution of precipitation in several heavy rain events, both at the Ohio River Forecast Center and the Southeast River Forecast Center. When comparing PE against model-derived QPF, forecasters can obtain a level of confidence in the spatial distribution and magnitude of QPF. In addition, PE has assisted WFO forecasters in refining their probability of precipitation (POP) forecasts. When applied alongside other useful parameters, such as the 950-850 hPa low-level jet, 300-200 hPa upper-level jet divergence, 700 hPa omega and others, PE is an even more valuable tool. For more information on Model-Derived Precipitation Efficiency, see the publication “*A Pilot Study Examining Model-Derived Precipitation Efficiency for use in Precipitation Forecasting in the Eastern United States*” in the National Weather Digest – Volume 26 Numbers 3, 4. For information on how to install the PE product and PE to POPs products to your D2D Volume Browser, or if you have comments on PE, email Jeffrey.Dobur@noaa.gov.